# FACT SHEET

For proposed National Pollutant Discharge Elimination System (NPDES) Permit No. WA0039845 to discharge to waters of the United States.

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| APPLICANT: | Washington State Department of Corrections<br>Post Office Box 41112<br>Olympia, WA 98504-1112 |
| FACILITY ADDRESS: | Clallam Bay Corrections Center<br>1830 Eagle Crest Way<br>Clallam Bay, WA 98326 |
| ISSUING OFFICE: | Washington State Department of Ecology<br>Southwest Regional Office<br>Post Office Box 47775<br>Olympia, WA 98504-7775 |

REASON FOR APPLICATION:

The existing permit will expire on June 18, 1997. General Condition G17. and 40 CFR Part 122, Section 21, requires a Permittee to submit a new application at least 180 days before the expiration date of the existing permit. The permit will be issued with an expiration date of June 30, 2002, to bring this permit into conformity with the Eastern Olympic Basin permit cycle year.

SOURCE OF DISCHARGE:

The domestic wastewater is produced by the inmates and staff at the Clallam Bay Corrections Center.

WASTEWATER TREATMENT PLANT (WWTP) DESCRIPTION AND HISTORY:

The WWTP is designated a minor facility by the U.S. Environmental Protection Agency (EPA) and the Department of Ecology (Ecology) because the design flow is less than 1 million gallons per day (MGD). The original treatment system, which began operating in 1987, was designed to treat a maximum month average wastewater flow of 0.14 MGD, a five day biochemical oxygen demand ($BOD_5$) loading of 320 pounds per day (lb/d), and a total suspended solids loading (TSS) of 260 lb/d.

The original WWTP consisted of a headworks with a manually cleaned bar screen and Parshall flume, two aerated lagoons, and a chlorine contact chamber. The effluent flows to a manhole in Sekiu where it is mixed with the effluent discharge from the Sekiu WWTP. The discharge flows through a 12-inch diameter outfall to the Strait of Juan de Fuca. The outfall has no diffuser.

In 1992, the WWTP was upgraded and expanded to provide treatment for an inmate population of 920 and staff of 400. The facility was converted to an activated sludge system which involved the installation of additional aeration in the first lagoon and construction of a secondary clarifier. Other work included installation of a mechanically cleaned bar screen, expansion of the chlorine contact chamber, installation of dechlorination equipment, and addition of an emergency power generator. The existing second lagoon was converted to use for aerobic sludge digestion and sludge storage.

An elevation error in the construction of the clarifier caused the clarifier to be inoperable without modification to the headworks. Even with the headworks modifications, the facility could not successfully perform as an activated sludge facility as it was designed. The treatment process was reverted back to the original aerated lagoon treatment within a year of the 1992 upgrade. Operating as an aerated lagoon process, the facility had difficulty meeting the revised 1992 permit, which included more stringent limits for TSS than the previous permit to reflect the expected performance of an activated sludge process. From November 1992 through the end of 1994, the discharge was in violation of the TSS limit in 23 of 26 months.

In 1993, a "Lemna" duckweed system was developed in the second lagoon to aid in reducing the TSS levels in the effluent wastewater. While the duckweed system improved the removal of TSS, the discharge continued to exceed the permitted limit until near the end of 1994. However, from December 1994 to December 1996 there were no TSS violations; a minor exceedence of 32 mg/l of TSS occurred in December 1996.

While the TSS removal improved over these couple of years, violation of the $BOD_5$ limit significantly increased, with permit exceedences in 12 of 24 months from December 1994 to December 1996. A report prepared by Brown and Caldwell (February 1996) concluded that, while the reduction of carbonaceous $BOD_5$ was sufficient to meet the permit limit, the biology of the duckweed lagoon favored the generation of ammonia, resulting in the $BOD_5$ limit exceedences. This conclusion was consistent with the result of $CBOD/BOD_5$ test comparisons conducted at the facility.

On January 19, 1996, Corrections and Ecology signed Agreed Order No. DE 95WQ-S397 and Addenda. The order required Corrections to prepare a wastewater pollution prevention ($P^2$) plan for the Clallam Bay facility and to implement a compliance schedule in Addendum A for the wastewater treatment facility. In accordance with the order, a $P^2$ plan was submitted in May 1996 which evaluated waste reduction measures to reduce hydraulic and organic loading to the treatment facility. Corrections has committed to implement cost-effective measures recommended in the plan, with a target of 10 percent reduction in organic loading to the facility. These measures are to be implemented no later than November 1, 1998. A fine screen is proposed to be installed at the headworks by November 1997 to further reduce organic loading to the facility. Further improvements, if necessary, will be determined through the annual review process specified under Section V. of the Agreed Order.

CHARACTER AND QUANTITY OF DISCHARGE:

The current treatment facility treats domestic wastewater from approximately 1280 inmates and staff, the population equivalent is approximately 1000 persons. From the Discharge Monitoring Report (DMR) data for January 1994 through October 1996, flow and loadings were:

| Parameter | Influent | Effluent |
|---|---|---|
| Average Flow, MGD | 0.080 | 0.097 |
| Max. Month Flow, MGD | 0.099 | 0.164 |
| Average $BOD_5$, mg/l | 400 | 32 |
| lb/d | 270 | 25 |

| Parameter | Influent | Effluent |
|---|---|---|
| Max. Month $BOD_5$, mg/l | 564 | - |
| lb/d | 408 | - |
| Average TSS, mg/l | 219 | 24 |
| lb/d | 148 | 19 |
| Max. Month TSS, mg/l | 281 | - |
| lb/d | 221 | - |

Design criteria for the facility are:

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|---|---|
| Population Equivalent | 1029 |
| Max. Month Influent Flow, MGD | 0.12 MGD |
| Max. Month Effluent Flow, MGD | 0.16 MGD |
| Max. Month Influent $BOD_5$ | 335 lb/d |
| Max. Month Influent TSS | 260 lb/d |

DISCHARGE LOCATION:

The WWTP discharges to the Strait of Juan de Fuca; Latitude 40 degrees, 16 minutes north, 08 seconds; Longitude 124 degrees, 17 minutes, 54 seconds west.

RECEIVING WATER INFORMATION:

The water quality standards for the Strait of Juan de Fuca, which has use classification "AA," are identified in Chapter 173-201A of the Washington Administrative Code (WAC 173-201A). Characteristic uses for Class AA marine waters shall include, but not be limited to, the following: salmonid migration, rearing, spawning, and harvesting; other fish migration, rearing, spawning, and harvesting; clam, oyster, and mussel rearing, spawning and harvesting; crustaceans and other shellfish rearing, spawning and harvesting; wildlife habitat; recreation; and commerce and navigation.

BASIS FOR EFFLUENT LIMITATIONS:

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR), 40 CFR Part 133, and in the state regulations, Chapter 173-221 WAC. These regulations are performance standards which constitute all known, available, and reasonable methods of prevention, control, and treatment for municipal wastewater facilities which discharge to waters of the state.

A. Technology-based Limitations

$BOD_5$. Both 40 CFR 133.102(a) and WAC 173-221-040(1) describe the minimum level effluent quality required for $BOD_5$.. WAC 173-221-050(6)(a) provides that Ecology may substitute the use of CBOD as an effluent limit in lieu of $BOD_5$ with the following levels of CBOD effluent quality provided: a 30-day average not to exceed 25 mg/l, a seven-day average not to exceed 40 mg/l, and a 30-day average removal of the influent concentration of CBOD of not less than 85 percent. The discharge shall comply with these CBOD limits. This change is made due to the suspected influence of ammonia on past $BOD_5$ measurements. A requirement for monthly monitoring of ammonia is included in the permit.

TSS. Both 40 CFR 133.102(b) and WAC 173-221-040(1) describe the minimum level effluent quality required for TSS. The WWTP effluent shall comply with the following TSS limitations. The 30-day average shall not exceed 30 mg/l; the seven-day average shall not exceed 45 mg/l; and the 30-day average removal shall not be less than 85 percent.

pH. 40 CFR 133.102(c) and WAC 173-221-040(3) describe the minimum level of effluent quality required for pH. The effluent pH value shall be maintained within the limits of 6.0 to 9.0 unless the WWTP demonstrates that: inorganic chemicals are not added to the waste stream as part of the treatment process; contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0; and the discharge does not cause water quality violations outside of an approved dilution zone.

Fecal Coliform Bacteria. WAC 173-221-040(2) contains the minimum level of effluent quality required for fecal coliform bacteria. The fecal coliform bacteria limits shall not exceed a monthly geometric mean of 200 organisms per 100 ml, and a weekly geometric mean of 400 organisms per 100 ml.

B. Water Quality-Based Limitations

In order to protect existing water quality and preserve the beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC), adopted in November 1992, is a state regulation designed to protect the beneficial uses of the surface waters of the state.

The Surface Water Quality Standards specify levels of pollutants allowed in a receiving water while remaining protective of aquatic life. These criteria are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in the permit.

WAC 173-201A allows Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones cannot exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The size of the mixing zone is restricted to a combination of the following: (1) the zone shall not extend in any horizontal direction from the discharge port(s) for a distance greater than two hundred feet plus the depth of water over the diffuser or point of discharge, and (2) shall not occupy greater than 25 percent of the cross-sectional width of the water body. Chronic water quality standards must be met at the boundaries of this mixing zone. The outfall is located approximately 550 feet offshore at a water depth of 25 to 30 feet. This results in a chronic dilution zone with the dimension of 225 feet in any horizontal direction from the discharge port.

In addition, the regulation allows a zone where acute criteria may be exceeded if the exceedence does not have the potential to damage the ecosystem. The zone where acute criteria may be exceeded shall not extend beyond 10 percent of the distance to the boundary of the chronic

mixing zone. This results in an allowed maximum acute dilution zone of 22.5 feet in any direction from the outfall.

Evaluation of compliance of the discharge with the water quality standards requires calculation of dilution factors at the boundary of the acute and chronic mixing zones. In the previous permit, the acute and chronic dilutions factors were evaluated using the computer modeling programs UMERGE, UPLUME, AND UOUTPLUM. Flows from the Clallam Bay Corrections Center were evaluated with the flows from the Sekiu WWTP. The resulting minimum dilution factors at the boundaries of the mixing zones were:

| | Acute | Chronic |
|---|---|---|
| Winter | 43 | 715 |
| Summer | 49 | 810 |

Ammonia. The discharge of ammonia was evaluated for compliance with the water quality standards in the previous permit. Acute values ammonia were 5.8 mg/l for the summer and 14.4 mg/l for the winter; Chronic values were 0.84 mg/l for the summer and 2.1 mg/l for the winter. This evaluation indicated that permit limits for ammonia were not necessary. However, installation of the Lemna duckweed system has resulted in a treatment process which may be producing higher concentrations of ammonia in the effluent. Effluent monitoring of ammonia will be required in order to better characterize the effluent and provide the data necessary to reevaluate the need for a limit in the future.

Chlorine. The previous permit determined the need for effluent chlorine limits of 0.56 mg/l total chlorine residual for a daily maximum and 0.22 mg/l total chlorine residual for a monthly average. These limits are not changed in this permit.

Whole Effluent Toxicity. The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, thus the name whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no WET testing is required in this permit. Ecology may require WET testing in the future if it receives information that toxicity may be present in this effluent.

OTHER PERMIT CONDITIONS:

A. Prevention of Facility Overloading. Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of loading and flow.

B. Operation and Maintenance. The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-15-, WAC 173-230, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

C. Residual Solids Handling. To prevent water quality problems the Permittee is required in permit condition S.7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and the Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the Clallam County Health Department.

D. Monitoring Frequencies. The permit's specified monitoring frequencies are based on the quantity of discharge. treatment method, significance of pollutants, and cost of monitoring.

E. General Conditions. General Conditions are based directly on state and federal law and regulations and have been standardized for all individual NPDES permits issued by Ecology.

F. Permit Modifications. Ecology may modify this permit to impose numerical limitations, if necessary, to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Quality Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

G. Procedures for Public Involvement in Final Determinations. Ecology has determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in this fact sheet.

Public notice of application was published on -- and -- in -- to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

Ecology will publish a Public Notice of Draft (PNOD) on --, in -- to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m., weekdays by appointment at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. Ecology will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Ecology will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. Ecology's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from Ecology by telephone at (360) 407-6279, or by writing to the address listed above.